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# BreezeACCESS<sup>®</sup> Wi<sup>2</sup> and BreezeMAX<sup>™</sup> Wi<sup>2</sup> – Release Note

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Release 2.0  
SW Version 5.2

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## System Description

Alvarion is extending its existing Wi<sup>2</sup> product line to now offer a complete, high end, highly scalable, pay as you grow end to end outdoor WiFi solution.

Wi<sup>2</sup> offers the ultimate IP wireless broadband solution for a variety of applications and services.

The Wi<sup>2</sup> solution provides the best of both worlds:

- Easy-to-deploy outdoor Wi-Fi mesh access solution integrated with built-in management and OSS support
- Readiness for immediate connection with the robust QoS capabilities of a BreezeMAX/BreezeACCESS backhauling network providing Personal Broadband services

Services delivered with Wi<sup>2</sup> range from basic public Internet access to public safety, traffic management, video surveillance, indoor coverage and other advanced voice, video and mobile applications.

The Wi<sup>2</sup> solution consists of a high end WiFi 802.11b/g AP (either the all outdoor Wi<sup>2</sup> or the Wi<sup>2</sup>-Extender) and a multi service Controller which controls and manages the Wi<sup>2</sup> APs in the network.

### Wi<sup>2</sup>

The Wi<sup>2</sup> is an all outdoor advanced ruggedized solution which can connect to Alvarion outdoor CPEs irrespective of their frequencies.

It is consisted of a state of the art outdoor 802.11b/g WiFi AP working in the 2.4GHz band, an outdoor power module that supplies power and connectivity, and a mechanical enclosure enabling easy deployment anywhere and seamless connection to VL/BMAX outdoor CPEs.

The Wi<sup>2</sup> in an intelligent QoS-rich AP, with high end security, diagnostics, roaming and Mesh support.

In addition, it has flexible power feeding (AC, DC or both for redundancy) and mounting capabilities (light poles, walls, roofs) and can use either OMNI antennas or high gain directional antennas.



### Wi<sup>2</sup> Extender

The Wi<sup>2</sup>-Extender is consisted of an outdoor WiFi 802.11b/g AP, an indoor unit (IDU) for power and connectivity and a mounting kit enabling easy deployment where ever is required.

The Wi<sup>2</sup>-Extender uses the same AP (SW and HW) as the 'regular' Wi<sup>2</sup>. As a result the Wi<sup>2</sup>-Extender has exactly the same WiFi feature set and performance as the Wi<sup>2</sup> and is managed by the same Wi<sup>2</sup> controllers.



The Wi<sup>2</sup>-Extender allows customers to have a cost effective offering where no all outdoor solution is required and enables extending the WiFi network using Mesh connectivity between APs in the network.

In addition, the Wi<sup>2</sup>-Extender can also connect to a VL / BMAX outdoor CPE by connecting the Extender IDU's Ethernet port to the IDU of the BMAX / VL CPE thus also allowing for robust QoS backhauling.

## Wi<sup>2</sup> Controller

The Wi<sup>2</sup> Controller offers not only advanced centralized management to the Wi<sup>2</sup>APs in the network but also a variety of additional features such as OSS and guest access services (embedded captive portal, embedded RADIUS server), advanced mobility and voice support and allows for real plug & play installation.



In addition the Controller enables the operator to easily connect to (using stand interfaces) other existing NOC elements, such as AAA and billing servers, thus facilitating the solution integration

Wi<sup>2</sup> Controller is available in 6 different models depending on the number of APs it can manage (10/40/200) and if additional mobility support is required.

No upgrades are available between the different Controllers.

## Solution Key Benefits and Advantages

- **Deploy mesh networks easily and cost effectively** - Wi<sup>2</sup> enables operators to work according to their specific needs and enjoy mesh benefits such as self-healing and lower network costs while still maintaining a robust, simple and high QoS network.
- **Integrate a complete, robust end-to-end one stop shop solution** - Wi<sup>2</sup> offers a wide range of important features. These include extensive network management with detailed statistics and diagnostics capabilities for easy evaluation of network performance and behavior; embedded OSS abilities with RADIUS servers, captive portals and accounting information; self-healing; powerful QoS for voice and video support; and extensive security features.
- **Increase revenue with multiple application network support** - Deliver a variety of independent services through the simultaneous operation of up to 16 different virtual networks (16 SSIDs) on the same infrastructure. Each network retains unique QoS, security, authentication, guest access services, management attributes and billing rates, allowing for revenue generation according to customer service level agreements (SLAs).
- **Improve ROI by extending the service offering to Wi-Fi end users** - Capture revenues from both Wi-Fi and WiMAX clients – existing wireless IP broadband operators can generate additional revenues from Wi-Fi end users using standard laptops, PDAs & Wi-Fi phones, while leveraging existing WiMAX networks.

- **Support advanced mobile applications** - The roaming and rapid handover support offered by Wi<sup>2</sup> enables the deployment of advanced mobile applications such as voice networks and transportation, as well as readiness for migration to a complete Mobile WiMAX network.
- **Reduce costs through easy plug and play installation anywhere, anytime** - The Wi<sup>2</sup> solution can be installed in any rugged outdoor conditions – including roofs, walls and light poles, thereby reducing site installation, acquisition and rental costs. Furthermore, plug & play installation enables operators to literally just connect the units to the power, with authentication, software updates and configuration performed automatically by the Wi<sup>2</sup> controller.
- **Support and manage networks with thousands of APs** - Wi<sup>2</sup> is a completely scalable solution which can easily support and manage deployments from tens to thousands of APs. Scalable network architecture enables operators to pay as they grow and minimize risks, without any additional or incremental costs.

## Ordering Information

P/N	Product Name	Description
<b>Wi<sup>2</sup></b>		
858700	ALVR-Wi <sup>2</sup> -ODU-b/g	WiFi 802.11 b/g outdoor access point with integrated 110/220 VAC and 48VDC power options for feeding the WiFi and backhauling unit together, up/down tilting option and pole (2"-6") mounting kit included. AC power cable connector and 0.5m Ethernet cable for connecting the backhauling unit are included. WiFi antennas, BreezeACCESS VL/BreezeMAX (CPE) backhauling unit are to be ordered separately. (For DC installation DC cable connector needs to be ordered separately). Supports all BreezeMAX Outdoor CPEs & BreezeACCESS VL Outdoor bridge type (BD) CPEs.
<b>Wi<sup>2</sup> Extender</b>		
858713	Wi2-Extender	Wi2 stand alone AP. Consisted only of the Wi2 all outdoor 802.11b/g access point together with an indoor unit (IDU) for power and Ethernet connectivity, enabling a cost effective solution for operators that do not require connection to the BreezeMAX or BreezeACCESS VL outdoor CPEs, while still enjoying all the high end WiFi functionality of the Wi2 solution. Wi2 Extender can communicate with other APs in the network using Mesh. The Wi2 extender also includes a mounting kit to support ease of installation and cables to connect the IDU to AC power. <b>Proprietary Indoor to Outdoor cable ('Wi2-Extender-Cable') is NOT INCLUDED and must to be ordered separately.</b>
858714	Wi2-Extender-Cable	30m outdoor cable to connect the Wi2-Extender outdoor AP to its IDU
<b>Wi<sup>2</sup> Controllers</b>		
858720	Wi2-CTRL-10	Wi2 controller that can manage up to 10 Wi2 APs. Located in the central office / NOC. The controller supplies centralized network management system, OSS, authentication, security,

P/N	Product Name	Description
		guest access services, captive portal, AP discovery, AP SW and configuration updates. There is no upgrade option between the different controllers.
858721	Wi2-CTRL-40	Wi2 controller that can manage up to 40 Wi2 APs. Located in the central office / NOC. The controller supplies centralized network management system, OSS, authentication, security, guest access services, captive portal, AP discovery, AP SW and configuration updates. There is no upgrade option between the different controllers.
858722	Wi2_CTRL-200	Wi2 controller that can manage up to 200 Wi2 APs. Located in the central office / NOC. The controller supplies centralized network management system, OSS, authentication, security, guest access services, captive portal, AP discovery, AP SW and configuration updates. There is no upgrade option between the different controllers.
858723	Wi2-CTRL-10-Mobility	Wi2 controller that can manage up to 10 Wi2 APs and support full mobility - fast handovers that support voice and mobility application at speeds of up to 100KM/H. Located in the central office / NOC. The controller supplies centralized network management system, OSS, authentication, security, guest access services, captive portal, plug & play installation including AP discovery and AP SW and configuration updates. There is no upgrade option between the different controllers.
858724	Wi2-CTRL-40-Mobility	Wi2 controller that can manage up to 40 Wi2 APs and support full mobility - fast handovers that support voice and mobility application at speeds fo up to 100KM/H. Located in the central office / NOC. The controller supplies centralized network management system, OSS, authentication, security, guest access services, captive portal, plug & play installation including AP discovery and AP SW and configuration updates. There is no upgrade option between the different controllers.
858725	Wi2-CTRL-200-Mobility	Wi2 controller that can manage up to 200 Wi2 APs and support full mobility - fast handovers that support voice and mobility application at speeds for up to 100KM/H. Located in the central office / NOC. The controller supplies centralized network management system, OSS, authentication, security, guest access services, captive portal, plug & play installation including AP discovery and AP SW and configuration updates. There is no upgrade option between the different controllers.
<b>Wi<sup>2</sup> Mechanical Accessories and Spares</b>		
858705	Mounting-kit-Wi <sup>2</sup>	Extended pole/wall mounting kit - 3 metal bands, for installations on non-vertical poles (2"-6") and on walls. (Wall installation screws are NOT included)
858702	Cable-conn-DC-Wi <sup>2</sup>	DC IP-67 cable connectors (pack of 5)
858703	Cable-conn-AC-Wi <sup>2</sup>	AC IP-67 cable connectors (pack of 5)
858704	WP-cap-Wi <sup>2</sup>	Waterproof IP-67 caps for BreezeWi2 DC or/and AC ports (pack

P/N	Product Name	Description
		of 5)
858706	Console-cable-Wi <sup>2</sup>	Console cable for Wi <sup>2</sup> Access Point management (pack of 5)
<b>Wi<sup>2</sup> Antennas</b>		
300621	ANT,BS,2.4-2.5G,8dBi, OMNI	8 dBi Omni-directional vertical antenna, 2.400-2.500 GHz, N-type male connector
723208	BS ANT 60/2.X V	Antenna 2.3 - 2.5 GHz, 60° sector vertical polarization, Terminating Connector: N female. RF Cable isn't Included.
723209	BS ANT 90/2.X V	Antenna 2.3 - 2.5 GHz, 90° sector vertical polarization, Terminating Connector: N female. RF Cable isn't Included.
723210	BS ANT 120/2.X V	Antenna 2.3 - 2.5 GHz, 120° sector vertical polarization, Terminating Connector: N female. RF Cable isn't Included.
<b>Wi<sup>2</sup> Antenna Cables</b>		
835308	OAC LMR-400-1-0.5	Outdoor unit to Antenna Cable, for use with BreezeACCESS models including outdoor units Length: 0.5m. Connectors: N male / N male 90 degree angle. Total loss @ 2.4 / 2.6 / 3.5 / 3.8 GHz: 1dB
835307	OAC LMR-400-1-1	Outdoor unit to Antenna Cable, for use with BreezeACCESS models including outdoor units Length: 1m. Connectors: N male / N male 90 degree angle. Total loss @ 2.4 / 2.6 / 3.5 / 3.8 GHz: 1dB
723218	OAC LMR-400-1-1.5	Outdoor unit to Antenna Cable, for use with BreezeMAX models with the regular Cushcraft antennas, including outdoor units Length: 1.5m.

## Recommended Order

- **Wi<sup>2</sup> (P/N 858700) and/or Wi<sup>2</sup>-Extender (P/N 858713)**, including:
  - Wi<sup>2</sup>-Extender-cable: P/N 858714 (only for Wi<sup>2</sup>-Extender but mandatory)
  - Mounting kit: P/N 858705 (only for Wi<sup>2</sup>, recommended for most deployments)
  - Console cable: P/N 858706 (at least 1 per customer)
  - 2 antennas: Either OMNI (2 x 300621) or directional (2 x 723208 / 723209 / 723210)
- **Wi<sup>2</sup>-Controller** (highly recommended for all deployments)

## Important Notes

- **Customers must undergo proper Alvarion training on the new Wi<sup>2</sup> solution prior to deploying the units**
- Most old Wi<sup>2</sup> units (version 1.0) can be upgraded to the new SW version.
- Interested customers are requested to contact Alvarion customer support for further assistance.

- In case of RMA the replacement unit/s would have the new SW version.
- The new Wi<sup>2</sup> SW version does not support WLG / White label format

## AP Limitations & Known Issues

- **Not all pages of the AP have the refresh system enabled.**
- **MAC addresses changes** - When switching an AP from autonomous mode to controlled mode, it is changing the MAC address of the Ethernet interface with the wireless one after the restart. To be able to get connectivity directly (without controller) to the AP in controlled mode, the ARP table within the management PC should be cleared up (arp -d).
- **AP in monitor mode:** RSSI /SNR values change when monitoring other AP - In the 'neighborhoods' page of an AP set to work in monitor mode, it displays different values of RSSI/ SNR of the seen APs, from a range of around +/- 3dBm at each refresh of the page.
- **Radio button doesn't refresh the web page** - When pressing the radio button of the radio page within the AP, the page doesn't refresh although some parameters were changed through the CLI.
- **Features not available within the CLI interface** - Antenna gain feature and max EIRP info are not available in CLI and SSH.
- **The displayed Tx power in status page** - The displayed TX power within the AP (status - wireless) is the value set in 'dBm' text box from the radio page, although this is out of range: for instance, if 30dBm is the TX power set, antenna gain is 0dBi and max available power is checked within the radio page of the AP, then the showed TX power from 'status' is 30dBm.
- **Warning message: 'the transmit power must be between 0 and 19'** - In both AP and CTRL, for set values of TX power out of range, the warning message: 'the transmit power must be between 0 and 19' appears for all working modes (b, g, b&g) although for b and b&g the transmit power should be between 0 and 20 dBm.
- For AP and for non-access controlled VSCs on access controller, it is not possible to reach the management tool via the web or CLI interface when coming from a wireless client associated with a VSC with a default egress VLAN or with a dynamic VLAN coming from RADIUS for 802.1x users.
- **VLAN attributes dropped** - VLAN attributes returned by a RADIUS server are dropped when MAC authentication is enabled on a VSC.
- **The Security Filters default gateway option** cannot be used when the service controller is configured as a PPPoE client.
- **802.1 x users** cannot re-authenticate in the event the RADIUS accounting STOP message is not acknowledged by the RADIUS server.
- **Accounting must be disabled on VSCs that use L2 mobility.**
- **Wireless devices lose connectivity** - The Wireless > Neighborhood feature alters the beacon timestamps when it is executed. This can cause some wireless devices to lose connectivity and re-associate. The workaround is to turn off neighborhood scanning.

- If a user authenticates with 802.1x/ RADIUS (e.g. WPA Enterprise) and the RADIUS server is down or sends no response, and then the client disassociates, the AP continuously retries the RADIUS request at the configured interval.

## Controller Limitations & Known Issues

- **DHCP server within the controller displays abnormal info** - The DHCP server within the controller could assign two IP addresses for an AP. The first shows 'GOLDFISH' as the client name, and for the other one the serial number of the AP appears correctly. This happens for APs that have a wrong .bid file. For this reason, some APs could not be managed through the controller.
- **Error message when selecting discovered AP's in the controller** – in some scenarios, under normal circumstances, the controller can display error messages like 'could not display the selected AP, please retry later'. This happens because the web page is refreshed periodically and so there are moments when the user can click to get the detailed information but gets the error message because in the meantime the device has gone (because it is rebooting, or it has been powered off, etc.).
- The **RIP2** MIB is not supported in this release.
- If **accounting** support is enabled on the Public Access > Access Control page after the controller has authenticated itself with the RADIUS server, then accounting will not started. To enable accounting, restart the service.
- On the Public Access > Access Control page, the **Allow any IP address** option is not supported when NAT is disabled on the Internet port.
- Users with an http proxy on the controller configured for proxy support will work on VSCs with an egress set as default but not with VLAN or GRE interface egress.
- **Source NAT** (Allow any IP address and to use Dynamic IP) does not work with the option to support clients using an HTTP proxy.
- **802.1x user** logging out via the session page may not get redirected to the Goodbye page.
- Adding a **new RADIUS profile** to the controller will cause all controlled APs to change to the un-synchronized state. This is normal as a new RADIUS definition must always be propagated to all APs.
- When **management IP address** is defined to be on the same subnet as the LAN port, changing the LAN port addressing method may cause the management IP address to be lost. The management IP address is defined on the Network > Ports > LAN port page.
- When adding or deleting a static route or when the IP address of the LAN port is changed, the **RIP protocol will not announce the new routes** until reset is performed.
- It is not possible to use a **server and client certificate for NOC authentication** that is signed by two different Certificate Authorities unless both certificates are installed on the controller. The SSL certificate to be installed on the controller must include the NOC CA component in a certificate chain.

- When using **EAP-TTLS**, the controller reports username as 'anonymous' rather than the actual username.
- The CLI command: "**Show radius users**" shows only non-Access Controlled users.
- It is not possible to start a packet trace from the **SNMP TOOLS MIB**.
- (Applies only to the WPA2 Opportunistic Key Caching option) **WPA2 Opportunistic Key Caching**, previously called L2 Fast Authentication, can only be enabled when the Mode is set to WPA2 or WPA, and the key source is set to RADIUS. As a workaround, temporarily disable WPA2 Opportunistic Key Caching in the VSC. The management tunnel can then be established with the AP. Following that need to change the key source in the VSC to RADIUS and again enable WPA2 Opportunistic Key Caching.

### Other Limitations

- In some cases a variation of up to 3dBm can exist between the configured and actual TX power
- Factory reset performed on an AP running in controlled mode will move the AP to autonomous mode
- The RSSI and noise floor indications that are displayed in WEB or CLI within the AP or through the CTRL could differ from the real ones with few dB.
- The LED's indication of the RSSI on the metallic shield of the AP are not functional for the current version of Wi2.
- Downlink throughput values could be less than the uplink throughput values for some scenarios
- In case of heavy traffic that is consuming all the available channel bandwidth, the AP could not transmit to the controller all the regular information and this one could display the message that it misses the connection with that controlled AP, although that AP is up and running and the traffic is passing
- For a local mesh link in between two APs to work properly, it's strongly recommended to have at least 20dB of SNR (best case is 34dB), and the two APs to be line of sight (LOS).
- Changes in MAC addressing - In this release, APs in controlled mode have a MAC address whose last digit is incremented by 1 over the Ethernet Base MAC address that is printed on the AP label and applies when the AP is in autonomous mode. For example, an AP with an Ethernet Base MAC address that ends with the digits "8C" use this address for autonomous mode, but when in controlled mode, the last digit of the MAC address changes from "8C" to "8D". These MAC address changes make it necessary to perform some additional tasks.